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PRELIMINARY

PRODUCT DATASHEET

Ultra-Narrow Linewidth 1550nm Laser

In BTF Package with Isolator

DL-CLS101EC-FP-S1550-LW100-ISO

A. PRODUCT DESCRIPTION

DenseLight DL-CLS101EC-FP-S1550-LW100-ISO is a cooled ultra-narrow linewidth laser in BTF package with an integrated isolator and PMF pigtail emitting at a specific wavelength. This product is based on a hermetic packaged external cavity fiber Bragg grating laser and an isolator, offering stable performance of lasing wavelength, narrow spectral linewidth and excellent SMSR. The Laser is packaged with a TEC and provides two thermistors to monitor the laser chip temperature and the case temperature.

B. FEATURES

- Strained InGaAsP/InP MQW gain chip coupled with built-in fiber Bragg grating
- Lasing wavelength of 1550nm
- Typical 10mW CW operation
- Optical output isolation >40dB
- Minimum SMSR of 45dB
- Maximum linewidth of 100kHz
- Polarization Extinction Ratio of >15dB
- Internal thermoelectric cooler
- Laser chip temperature monitor thermistor
- Case temperature monitor thermistor
- RoHS Compliance

C. APPLICATIONS

- OTDR
- Optical measuring instrumentation
- Optical gas and chemical sensor
- Doppler LIDAR
- BOTDR

D. ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Condition	Min	Max	Unit
Reverse voltage	V_R	-	-	2	V
Forward current	I_F	-	-	200	mA
Forward voltage	V_F	I_{op}	-	2.5	V
Laser chip temperature[1]	T_{chip}	I_{op}	15	45	°C
Operating Case temperature[2]	T_{case}	I_{op}	0	60	°C
Thermoelectric cooler voltage	V_{TEC}	-	-	4.8	V
Thermoelectric cooler current	I_{TEC}	-	-	2.5	A
Storage temperature	T_{stg}	Unbiased	-40	85	°C
Storage humidity	RH_{stg}	Unbiased	5	85	%RH
Electro static discharge (ESD)	V_{ESD}	Human body model	-	500	V
Lead soldering temperature	S_{temp}	-	-	260	°C
Lead soldering time	S_{time}	-	-	10	sec

1) T_{chip} is monitored by internal thermistor 1 with external pin out (pin 2 & 5)
2) T_{case} is monitored by internal thermistor 2 with external pin out (pin 12 & 13)

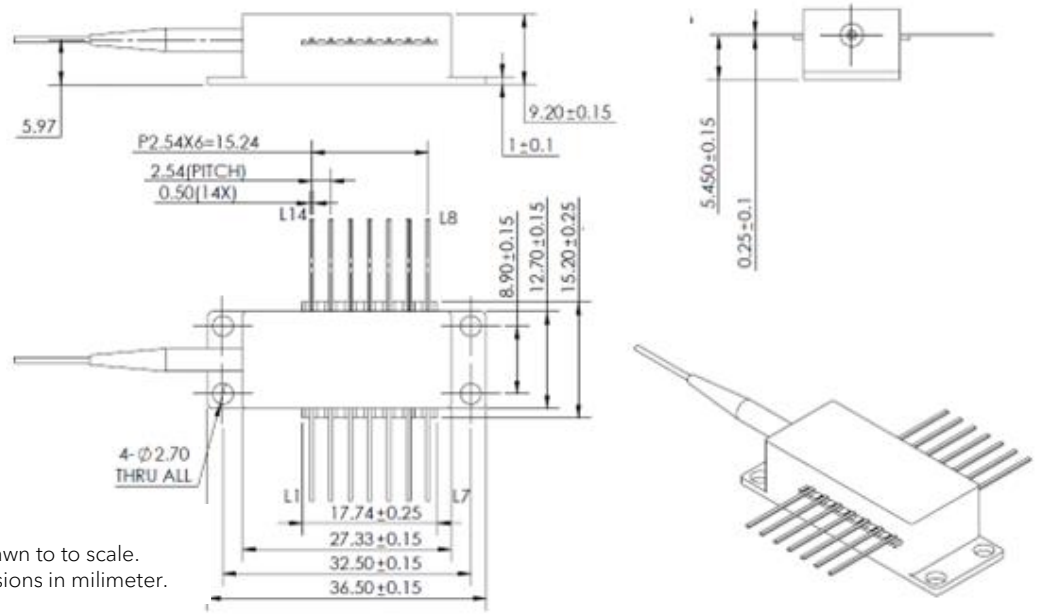
E. ELECTRICAL AND OPTICAL CHARACTERISTICS[3]

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Optical output power	P_O	CW, I_{op}=120mA	10	–	–	mW
Threshold current	I_{th}	CW	–	–	20	mA
Operating current	I_{op}	CW, P_o=10mW	–	100	120	mA
Operation voltage	V_{op}	CW, P_o=10mW	–	1.1	1.5	V
Slope efficiency	η	CW, P_o=10mW	0.06	0.12	–	mW/mA
Peak wavelength	λ_p	CW, P_o=10mW	1548	1550	1552	nm
Side mode suppression ratio	SMSR	CW, P_o=10mW	45	55	–	dB
Polarization extinction ratio[4]	PER	CW, P_o=10mW	15	20	–	dB
Linewidth	Δλ	CW, P_o=10mW	–	–	100	kHz
Optical Isolation	ISO	–	40	–	–	dB
Thermistor 1 resistance	R_{therm1}	T_{therm1} = 25 °C	–	10	–	kΩ
Thermistor 2 resistance	R_{therm2}	T_{therm2} = 25 °C	–	10	–	kΩ

3) All measurements are done at T_{chip} =25 °C T_{case} =25 °C unless otherwise specified
4) Polarization and connector key aligned to slow axis

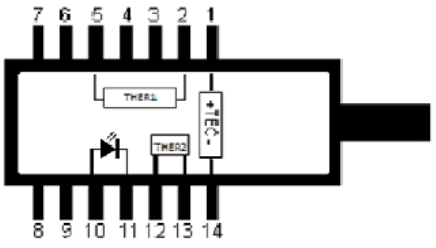
F. PHYSICAL CHARACTERISTICS

Part	Description
Package type	14-pin BTF
Fiber:	Panda PMF
MFD	10.5μm
Cladding diameter	125μm
Coating diameter	245μm
Fiber pigtail length	>1m
Fiber connector	FC/APC, key aligned to slow axis



Note:
Not drawn to to scale.
Dimensions in milimeter.

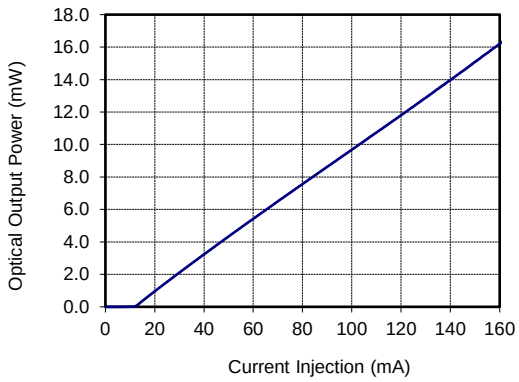
Pin Assignment	
1	TEC (+)
2	THERMISTOR1
3	
4	
5	THERMISTOR 1
6	–
7	–
8	–
9	–
10	LD ANODE (+)
11	LD CATHODE (-)
12	THERMISTOR 2
13	THERMISTOR 2, CASE
14	TEC (-)



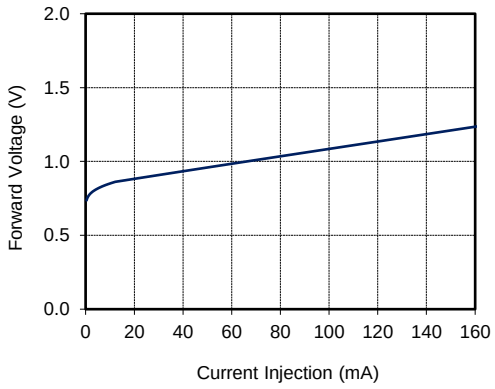
Top view

G. TYPICAL PERFORMANCE CHARACTERISTICS

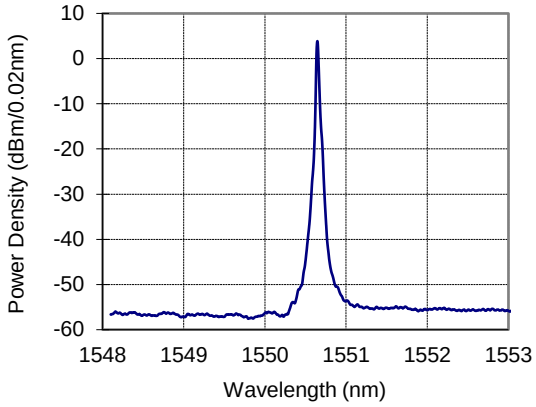
Operating condition: T_{chip}= 25 °C



P-I Curve



I-V Curve



Spectrum

H. PRODUCT NAMING

DL-CLS101EC-FP-S1550-LW100-ISO

DL: DenseLight

CLS: Cooled Laser Source

10: Optical Power 10 mW

1: CW Operation

E: Extended BTF

C: Case temperature monitor

FP: Polarization Maintaining Fiber

S1550: Lasing peak wavelength

LW100: Linewidth 100kHz

ISO: Integrated isolator

I. DISCLAIMER FOR CUSTOMER SPECIFIC APPLICATIONS

DenseLight product is not intended for use other than stated on the application note or as defined in the product specification. The performance of the product should always be tested in the actual application conditions. As our products are used in conditions beyond our control, we cannot assume any liability for damage caused through their use. Users of DenseLight products are solely responsible to thoroughly test and qualify their system and / or application for their intended application and have determined such at their sole discretion. DenseLight cannot assume any liability for the use of our products in conjunctions with other. Customer assumes the sole risk and liability of the product performance other than specified by the product specific data sheet or application notes without DenseLight's specific written consent.